

$$I = \int_{-1}^5 \left(e^{-x^2} + x^2 \cos \frac{1}{x} \right) dx \quad I_2$$

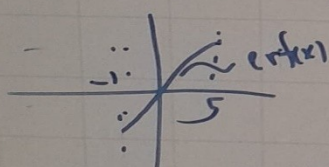
$$\rightarrow \underbrace{\int_{-1}^5 e^{-x^2} dx}_{I_1} + \underbrace{\int_{-1}^5 x^2 \cos \frac{1}{x} dx}_{I_2}$$

$$I = I_1 + I_2$$

$$\int u dv = uv - \int v du$$

Recordar:

$$\left(-\frac{c}{\pi} \right)^{\frac{1}{2}} \int_p^q e^{-cx^2} dx = \frac{1}{2} \left(\operatorname{erf}(q\sqrt{c}) - \operatorname{erf}(p\sqrt{c}) \right)$$



Impar

$$\rightarrow \operatorname{erf}(-x) = -\operatorname{erf}(x)$$

$$\rightarrow I_1: \int_{-1}^5 e^{-x^2} dx = \frac{\sqrt{\pi}}{2} \left(\operatorname{erf}(5) - \operatorname{erf}(-1) \right)$$

$$I_1 = \frac{\sqrt{\pi}}{2} \left(\operatorname{erf}(5) + \operatorname{erf}(1) \right)$$

$$dx \quad I_2: \int_{-1}^5 x^2 \cos \frac{1}{x} dx$$

$$\hookrightarrow \int x^2 \cos \frac{1}{x} dx$$

$$u = \frac{1}{x} \rightarrow du = -\frac{1}{x^2} dx$$

$$\rightarrow \int -\frac{\cos u}{u^4} du$$

vdv

$$\rightarrow -\int \frac{1}{u^4} \cos u du$$

erf(pvc)

$$u = \cos u \quad dv = \frac{1}{u^4} du$$

$$du = -\sin u \quad v = -\frac{1}{3} u^{-3}$$

$$\left(\operatorname{erf}(5) - \operatorname{erf}(-1) \right) \left(\operatorname{erf}(5) + \operatorname{erf}(1) \right)$$

$$-\int \frac{1}{u^4} \cos u du$$

$$-\left(\frac{1}{3} u^{-3} \cos u - \int \frac{1}{3} u^{-3} (-\sin u) du \right)$$

$$\frac{1}{3} u^{-3} \cos u + \frac{1}{3} \int u^{-3} \sin u du$$

$$u^* = \sin u \quad dv^* = u^{-3} du$$

$$du^* = \cos u du, \quad v = -\frac{1}{2} u^{-2}$$

$$\frac{1}{3} u^{-3} \cos u + \frac{1}{3} \left(-\frac{1}{2} u^{-2} \sin u - \int -\frac{1}{2} u^{-2} \cos u du \right)$$

$$\frac{1}{3} u^{-3} \cos u - \frac{1}{6} u^{-2} \sin u + \frac{1}{6} \int u^{-2} \cos u du$$

#3

$$I_3 = \int u^{-2} \cos u du$$

$$u^* = \cos u \quad dv^* = u^{-2} du$$

$$du^* = -\sin u du, \quad v = -\frac{1}{u}$$

$$I_3 = -u^{-1} \cos u - \int -u^{-1} (-\sin u) du$$

$$= -u^{-1} \cos u - \int \frac{\sin u}{u} du$$

recondar:

$$SI(x) = \int \frac{\sin t}{t} dt$$

$$\hookrightarrow I_3 = -u^{-1} \cos u$$

$$\rightarrow I_2 = \frac{1}{3}$$

$$R = I_1$$

$$R = \frac{\sqrt{\pi}}{2} \operatorname{erf}(5) + \frac{\sqrt{\pi}}{2}$$

SI

SI(

$$I_3 = \int u^{-2} \cos u \, du$$

$$u^* = \cos u \quad dv^* = u^{-2} \, du$$

$$du^* = -\sin u \, du, \quad v = -u^{-1}$$

$$I_3 = -u^{-1} \cos u - \int -u^{-1} \sin u \, du$$

$$= -u^{-1} \cos u - \int \frac{\sin u}{u} \, du$$

754

recordar:

$$Si(x) = \int \frac{\sin t}{t} \, dt$$

$$\frac{1}{u^4} \, du$$

$$= -\frac{1}{3} u^{-3}$$

$$du$$

$$\hookrightarrow I_3 = -u^{-1} \cos u - Si(x) + C$$

$$\rightarrow I_2 = \frac{1}{3} x^3 \cos \frac{1}{x} - \frac{1}{6} x^2 \sin \frac{1}{x} - \frac{1}{6} x \cos \frac{1}{x} - \frac{1}{6} Si(x) + C$$

$$- \int \frac{1}{3} u^{-3} (\sin u) \, du$$

$$R = I_1 + I_2$$

$$\int u^{-3} \sin u \, du$$

$$R = \frac{\sqrt{\pi}}{2} \operatorname{erf}(5) + \frac{\sqrt{\pi}}{2} \operatorname{erf}(1) + \frac{245}{6} \cos\left(\frac{1}{5}\right) + \frac{1}{6} \cos(1) -$$

$$- \frac{25}{6} \sin\left(\frac{1}{5}\right) - \frac{1}{6} \sin(1) - \frac{1}{6} Si\left(\frac{1}{5}\right) -$$

$$- \frac{1}{6} \frac{Si(1)}{6}$$

$$u^* = \sin u \quad dv^* = u^{-3} \, du$$

$$du^* = \cos u \, du, \quad v = -\frac{1}{2} u^{-2}$$

$$\frac{1}{3} \left(-\frac{1}{2} u^{-2} \sin u - \int -\frac{1}{2} u^{-2} \cos u \, du \right)$$

$$- u^{-2} \sin u + \frac{1}{6} \int u^{-2} \cos u \, du$$

$$\neq 3$$

$Si(x)$ Impar

$$Si(-1) = -Si(1)$$